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BRIEFS

TRUTH IN REPORTING. Accurate position reporting in communications with air traffic control is not just a matter of convenience for controllers. It can be a matter of life and death. Recently a Bell 206B, en route to Teterboro, NJ, reported coming up on the Meadowlands Sports Complex when he was in fact nearly two miles away. A collision occurred at 650' AGL, in 30 miles visibility, with a small commuter on left base to the runway. Two persons died; two suffered serious injuries. Tower controllers rely on the accuracy of pilot position reports since radar confirmation may not be available at the airport.

YOKE JAM. Control wheel yokes on some Cessna 172N aircraft have become jammed in the full forward position during stall recovery, necessitating strong back pressure on both yokes to free the controls. The problem occurred during flight instruction when heavy forward pressure on the righthand control column pushed the left yoke beyond its safety stop. Owners and operators of all models of the Cessna 172 should refer to Cessna Service Information Letter SE 82-38 for modification procedures. Only FAA certificated airframe maintenance technicians can perform the modification.

HOLEY OIL. Rocker arm shafts in some Lycoming aircraft engines have been found to wear holes in cylinder rocker box covers, resulting in loss of engine oil. Shafts with nicked or rough ends are especially a problem. Lycoming Service Bulletin No. 400 calls for the installation of teflon thrust buttons in the ends of rocker arm shafts to minimize wear to box covers. Oil loss in this area should be checked by a properly certificated person who is authorized to accomplish an necessary rocker arm shaft repair.

COST AND EFFECT. New subscribers and renewing readers are regretfully reminded that the subscription price of FAA GENERAL AVIATION NEWS is now $14.00 a year ($17.50 foreign). To avoid delays and unnecessary paperwork, please use only the order form attached to the current issue. Additional feature material is planned to help compensate for the unexpected price increase.

Ah, Wilderness!

Practical preparations for post-crash survival in the mountains

Our guide led us into the area on foot over what I suspected was a very roundabout route, some three or four miles uphill over a densely forested mountainside, following a succession of wild animal trails rather than any definable path. About 9:30 in the morning we came into a partial clearing where we found the wrecked fuselage of a three or four year old Mooney Mark 20. We were positioned on the ground nearby and given the details of our "scenario."

The four of us had survived the crash, which had sheared off the wing of the aircraft, absorbing some of the impact force. We had gone down after experiencing engine failure while sightseeing over the White Cloud Peaks of central Idaho. We had diverted from our VFR flight plan (Boise to Seattle via Wenatchee) without informing Boise Radio and we were at least 50 miles off course, somewhere in the Sawtooth Wilderness Area. Our pilot had radioed a last-minute Mayday, but there was no reply and we were not certain our signal had been picked up by anyone or blocked out by the steep terrain.

Impact damage had smashed up the tail section pretty badly, so it was questionable whether the ELT was operating—and the cockpit radios were useless. Survival gear was limited to one wool blanket each and whatever else we happened to be wearing, but **no matches.** *Each of us had specified injuries, and no first aid equipment. Survival tactics would be entirely up to us. We would be rescued as soon as assistance could reasonably be expected to arrive, in response to our signalling efforts. We could "give up the game" at any time, for medical or other reasons, by blowing on a special whistle to summon members of the survival course staff, who would be observing us discreetly at a distance. The staffers could also terminate the game at any point when they considered our situation hopeless. Our guide disappeared before we could ask any more questions.*

Fred, the pilot, got us together and we evaluated our injuries. The most seriously hurt person was the photographer, Jean, who had been sitting up front with her cameras; she had chest injuries and was in shock. We used the blankets to cover her and make her comfortable, after checking for visible bleeding. Eloise, who had sat opposite me in the back seat (she flew with the CAP out of Wenatchee) had a twisted ankle, which was bandaged with a neckerchief. Fred had a broken bone in his leg, which required splinting.

We used some material from the aircraft seat cushions as pads, and boot laces (mine, since I was the only one wearing boots) for ties. My injuries were limited to cuts and bruises, so I did all of the initial running around for materials. While rumaging inside the fuselage I had found an empty beer bottle intact, and I remembered that we had crossed over a small stream not far back, so I retraced our path and found water. I brought back the filled bottle capped with a twig. By this time the photographer, Jean, had come out of her "shock" condition and was sitting up.

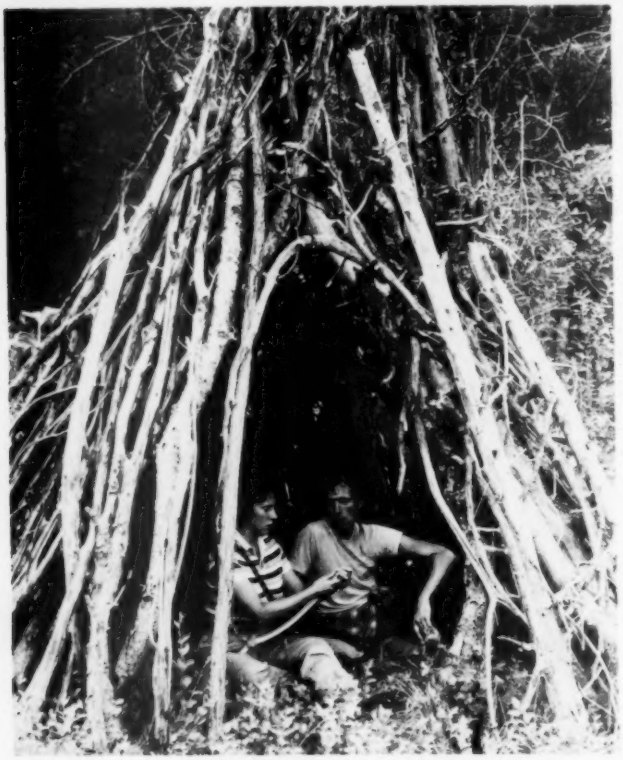
At this point all of us seemed to have a different idea about what to do next. I thought that the simplest thing to do was for me to follow the creek downhill until it crossed a road or fed into a valley stream, where there was certain to be human habitation. With any luck, everyone would be rescued by nightfall.

But Eloise thought the first thing we should do was start working on a signal fire; she had heard several aircraft flying over already. And Jean pointed out that in our practice sessions, even with prepared materials at hand, which we did not have now, it had taken three or four hours to get a fire started with a makeshift bow drill or flint and steel. She thought we should concentrate our efforts on building an S.O.S. signal out of rocks in the clearing, and then start looking for food sources.

Since I was the only completely mobile person I found myself being burdened with half a dozen urgent requests: collect firewood, cut bow drills, gather stones, pull out aluminum from the plane, look for food, fetch water, etc. My inclination to take a hike downriver increased.

Fred, who I realized had far more background in survival training than any of us, listened patiently to what everyone had to say but restrained us from launching any projects until we had time to really collect our thoughts. He reminded us of what we had learned in our training sessions, particularly the idea that survival was an instinct strongly rooted in all of us, however dormant in civilization, and that in order to be guided by it we had to take time to switch over to a different type of living. The task was not to get back into our accustomed life patterns in the shortest possible time—since a hasty return might not be possible, and unnecessary haste might worsen our predicament—but simply to **survive;** *and the key to survival was adapting ourselves to our immediate environment and disabusing ourselves of the notion that this environment was hostile.*

There were, after all, no unfriendly natives or animals that would harm us unless provoked (we had seen a few bear signs, but poisonous snakes were rare in this particular area). We had located water. It was summer, which meant that there would be edible plants or fruit. None of our injuries were life-threatening. Whatever planned activities we would have to forego could, in all probability be cancelled or carried out at some other time without any severe dislocation of our lives. The pressure that rose from the thought, We have to get back into our normal life



Indian style "wicki-up" provides framework of wilderness shelter for crash survivors. Dead tree limbs, vines are natural building materials.

patterns immediately! was, in short, self-induced. It could be the most dangerous thing we had to cope with.

Fred reminded us of the figures we had seen which showed that a majority of downed aircraft, which were later recovered with survivors, were located within a few days, but **only about one in 10 downed aircraft was located by means of the ELT signal.** *Flight plan information, plus ground signalling and good survival tactics, were still the predominant lifesaving factors. And finally, most survivors are rescued* **at the wreckage site.**

In our case, we could expect no formal search and rescue effort to begin before 3:30 p.m., half an hour after our ETA in Seattle. And since we were some distance off the flight path, we could hardly expect any aircraft to be looking for us here for at least 24 hours. Maybe quite a bit longer. Random flights overhead probably would not be of much use, unless they had picked up any ELT signals. At this time of the year the woods were full of campers and campfires—and litter. From where we sat the fuselage stood out like a sore thumb, but from 1,000 feet overhead it would be pretty well disguised by the terrain.

To be effective, our visual S.O.S. signal on the ground would have to be in a distinctively cleared area with an unnatural shape (such as a rectangle) and made of materials with good color contrast—pieces of airframe aluminum or brightly colored scarves would be good. To be meaningful our fire would have to pour out a lot of black smoke by day (aircraft rubber or plastic were good for this), and perhaps white smoke signals by night. Finally we needed a shelter against weather, so we could keep our strength and spirits up with sleep. It was pleasant and dry now, but rainsqualls were common in the mountains and it turned cool at night at this altitude (about 4,500 feet). We had a lot to do by nightfall, and the number one priority item, in Fred's view, was setting up our shelter.

The rest of us tended to disagree with Fred's order of priorities, especially when an aircraft flew directly overhead as we spoke, but we decided to humor him. There were many hours of daylight left, and the whole affair still seemed pretty much of a lark. As a concession to our concern for immediate signalling, Fred reminded us that a reflecting mirror was one of the most distinctive aids to search and rescue, and the chances were that one of the ladies had one in her purse.

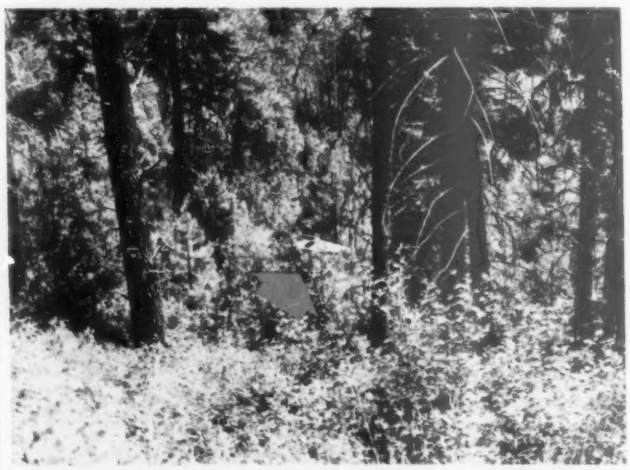
He was right. Jean was assisted to a position of leaning against a tree in the sunlight where she could signal aircraft. Fred had been carving himself a crutch from a willow limb as we talked, and this enabled him to move about slowly with his splinted leg. Eloise limped along with the aid of a staff to support her bad ankle.

About 50 yeards above the spot where we had crashed we found a level strip of land, probably an old logging road. (We decided not to try sleeping in the fuselage, which was heavily battered, with little room to stretch out.) The campsite we chose had an unobstructed view of the sky, and the terrain above was heavily overgrown with trees and bush, so we and our fire would not likely be flooded out. Handily there was also a pile of deadfalls nearby.

We used a long pole as a rooftree, lashing it with vines to a crotch between two young trees about eight feet apart. We then proceeded to construct a rough but sturdy-looking A-frame shack with dead tree limbs stacked from the ground to the rooftree as rafters. For shingles we used the leaflike fronds of a wild native variant of the lily family, which grew four or five feet high and had a thick, tough stem.

By noon it was pretty warm, and while no one seemed to be concerned about missing lunch (we had all eaten a good solid breakfast), everyone kept getting thirsty. The creek was not far, but its banks were so heavily overgrown with thorny brush that my task of providing drinking water for everyone, at a couple of swigs per trip, began to lose its savor. I was also called upon to haul in firewood, aluminum from the aircraft for the S.O.S. that Jean was making, and flinty stones for Eloise who was trying to start the fire with a steel knife, stone and some lightning-charred bark.

On one of my errands I stumbled over a bee's nest in the ground and was bitten on the right hand before I could back off. In a short time that hand was about twice as large as the left and I was in real pain. Fred came hobbling out of the woods with some plantain leaves which he said had an antihistamine effect, once they were chewed up thoroughly and applied as a poultice. So I sat down on the ground and chewed away like a cow on her cud and tried to avoid swallowing the gooey green mass and getting sick. I threw about half if it away and bound what I had chewed to my wrist and hand with a handkerchef. But I didn't feel like going back to work. I realized I was tired of the whole exercise, the heat, the flies, the bees, the endless requests, the makeshift tools, the make-believe injuries and my very real pain. I lay back on some grass and fell asleep.



Wrecked fuselage in trees (center) is difficult to spot from the air.

About three o'clock Fred came over and asked how my hand felt. Either the rest or the poultice appeared to have done some good, at least the swollen area had not enlarged. On the other hand I was still sick to my stomach from chrewing the plantain. Fred was sympathetic but he said that it was important we complete our main tasks today, that we would feel less energetic as the days went by. He said it was also important that we be together, that I not let my pain isolate me from the others. Pain sometimes did that to people. Then he put the chopping knife in my left hand and hobbled away to see how Jean and Eloise were coming along with their combined efforts to ignite the charcoal.

An hour later, as we were putting the finishing touches on the shelter, I heard a wild whoop behind me and thought sure we had a bear in camp. It turned out to be a victory cry from Jean, as she and Eloise—miracle of miracles—had actually nourished a spark in charcoal into a fire. We hugged eath other with a kind of ridiculous but very real exultation. We felt that somehow we had gained control over our environment, and were no longer its prisoners. If we could make fire out of virtually nothing, we could do anything.

Still in a very elevated mood we went off in different directions to gather food. Fred stayed close to me, partly to help me find more plaintain, which he thought I would need, but also to make sure that I didn't eat the wrong kind of berries or bulbs. I was amazed at his knowledge of the edible wild, which included not only plants and trees but virtually every form of living matter.

Within a radius of a dozen feet of where we stood he could identify ten to twenty different species and indicate which part of the plant was edible and how to prepare it for eating. Trees, which I thought were only for beavers, were a year around emergency food for anyone who knew enough to remove the tender inner bark. A century ago whole Indian villages had wintered over on tree bark.

Fred showed me how to remove the head of an ant before eating it raw (excellent protein source). I filed that knowledge away for a hungrier day.

We ate our fill of wild blueberries, varied with a few of the season's last strawberries, and brought the rest of our gleanings back to camp for our common stewpot. The pot itself was an artifact in the early sense of the word. We called it "neolithic Mooney". It was entirely hand made with stone hammers over a large stone anvil. It was ugly to look at and difficult to use, since it would not sit upright over the fire, but we solved that problem by fashioning a potholder out of the wire pin of a piano hinge salvaged from the plane's tail section and we were in business.

Into the pot went salsify (oyster plant) roots, sego lily blubs and stalk, nettle leaves, thistle (cooking seemed to take the sting out of the latter two plants, despite my doubts) and a scattering of wild onions and yarrow. After half an hour's cooking it could have been Anything Stew, but everyone ate some dutifully. I preferred to deal with my portion as soup, leaving the solid material behind as I suspected it included some small animal contributions. Imbibed with a crude spoon, hacked out of aluminum at the expense of my hunting knife, it was not Cordon Bleu but it was tangy as hell and full of nutritious trace elements (I was told) as well as some vitamin A and C and even a few grams of protein.

The pot was washed out and refilled with a tea infusion which included dandelion flowers (early buds only), rose hips, strawberry leaves, service berries and young pine needles. This too was tangy and nutritious, if somewhat puckering to the palate. We sang a few songs around the campfire, and then began to work out our sleeping arrangements.

These were made on a strictly utilitarian basis, with one person on fire watch all through the night, beginning with Eloise at 8:00 p.m.. We remaining three would take up positions in the shelter in the order of our watch—i.e., Fred would lie nearest to the entrance, Jean in the middle, and I at the back. At 10:00 p.m. Eloise would awaken Fred and take his place. At midnight he would awaken Jean and take her place, etc.

The plan sounded good in theory, and in daylight, but after dark it was another matter. The small A-frame, when occupied by three sleepers, gave very little headroom, so it was necessary to grope around on all fours to find one's watch relief—which led to mistaken identity, bumped heads and trodden-on faces and stomachs. At each watch change everyone was aroused out of a fitful, hard-to-return-to slumber and there was confusion over blanket rights, sleeping spaces, personal possessions and the like. It was difficult at best to sleep that close to strangers, in confining quarters on cold, hard ground, without repeated awakenings and irritable whisperings. I kept thinking how much difference one small flashlight with spare batteries would have made, and how many pilots I knew who flew without that minimal emergency equipment. One by one we abandoned the shelter and crouched near the fire in our blankets. We eventually all dozed off.

When I awoke the others were still asleep but the sun was about an hour high and the fire was almost dead. I built it up and went down to the creek for a drink and a wash. I discovered that my bee sting reaction had flared up again (the poultice had been lost in the shelter). The swelling had advanced beyond the wrist, and I had developed a secondary reaction over other parts of my body. I found some plantain leaves in the woods and sat down to the slow, nauseous task of masserating it with my teeth and building a new poultice.

The other survivors awakened in pretty good spirits, and Fred organized a food-gathering breakfast stroll. I declined to go, feeling little inclination for food after the greening of my palate with plantain. My personal discomforts, which I preferred not to discuss, tended to alienate me from the others, with their pseudo ailments. The more I thought about it, the more reasonable it seemed to me to just "blow the whistle" and summon one of the course observors to remove me from the scenario. The prospect of spending another whole day laboring at thankless tasks without even the simplest of tools, and forcing down unpalatable nature food, did not appeal to me. I felt that I had learned my lesson about flying over unsettled areas without adequate survival gear in the aircraft, and didn't need any further reinforcement.

When the foraging party came back and started brewing a morning teapot I got Fred aside and told him how I felt. He urged me to reconsider. He said that the most important part of the training was not what we learned intellectually, which could always be found in books, but how we actually dealt with our feelings in unfamiliar circumstances. In a real life emergency situation there would always be some unexpected or disturbing elements, and if I walked out now I would never know whether I could handle them successfully—or whether I would further endanger my life and those of my companions by separating myself from them. He believed that this form of "get-away-itis" very often led to unnecessary loss of life among aircraft crash survivors. As for my swollen arm and associated skin inflammation, he was certain that the fresh tea they were brewing, plus a fresh poultice and a little rest would improve my condition in a short time.

I was skeptical but I agreed to wait until afternoon and see how I felt then. The tea was brewed and shared while we discussed various work projects for the day, which included improving and enlarging our shelter, removing the aircraft wheels for black smoke signalling, and making some better cooking and water utensils. However, no one showed any strong inclination to begin work, and it was evident that our energy levels had subsided noticeably from the day before. That worried some of us. But in Fred's view this was an indication our metabolism was shifting into a slower, survival mode, and a sign of health rather than the opposite.

With this assurance we all indulged in a noon siesta for about an hour, which was interrupted by a clap of thunder. Dark, heavy clouds were working their way up the valley below and it looked like we were in for a good thunderstorm. Protecting the fire and waterproofing our shelter became immediate objects of concern.

The airplane was a big help. We detached a large section of engine cowling and lugged it up to the windward side of the fire, where it formed

Natural Nourishment

Berries	Spring, summer, fall. Eat only what you can recognize, chiefly blueberries, strawberries, currants, service berries. (Look out for bear competitors.)
Plants	Most are edible raw, cook if needed. Dig carefully for bulbs, roots. Avoid bulbs that taste bitter. Leave mushrooms alone—too risky, little value.
Winter Fare	Inner bark of trees, fresh, boiled or dried. Young pine needles, raw or brewed for tea. Strawberry leaves (search under snow cover).

a protective shell. We bent other pieces of aluminum to place over the rooftree of our shelter to keep out rain, and cut more lily fronds to solidify the shingling.

While we were working around the airplane we tried to remove a wheel, but found it impossible without tools. I also tried, unsuccessfully, to hack off large pieces of tire rubber with my knife. Then I understood why some pilots who flew often over mountainous areas kept a mini-hacksaw in their aircraft.

By evening there was still no rain, and the sky seemed lighter, so we tapered off work. We made a hasty stew of local plants, piled up a lot of firewood and banked the fire under the protective shell. Then we all crawled into our shelter, which seemed snug and cozy in the twilight.

Some after dark the storm broke directly overhead, with a great rush of wind and a downpour that became heavier by the minute. Our frond shingles kept us dry for about five minutes, and then let in a dripping deluge. The thick wool blankets afforded us another few moments of dryness, but gradually they became soaked with water. Despite the fact that we were practically hugging each other we were soon shivering with the damp cold and finally we all made a dash for the fire which, thanks to the shell, had not been quenched. We managed to rig up a partial shelter with the blankets, and there we sat in soggy silence. Some time before dawn we fell asleep, from sheer exhaustion, huddled together like outcast orphans. At least that is how we were described by the rescue party, who awakened us on a beautiful, clear morning with the cry, "You've been found! Congratulations!"

It took some effort for us to pry our stiffened limbs apart. We hardly said a word at first, just smiled. I felt a strange mixture of relief and sadness—the ordeal was over, but so, also, was the sense of sharing a strangely intense experience.

A cold fresh orange revived us enormously, and except for a little weakness in the legs we had no difficulty walking the few miles back to the survival school base camp. A luxurious bath in a local hot spring, a hearty breakfast, and we were all in high spirits again.

In critiquing our experience, we all agreed that not giving sufficient attention to our sleeping shelter was our only serious error. We could imagine how badly injured survivors would have fared in the wet in a real life situation. We were so much in the habit of depending upon the labor of others for shelter, in civilized life, that we had just not taken this survival requirement seriously. We could have kept drier and warmer inside the fuselage, however cramped and uncomfortable that would have been. Or we could have done more with aluminum to roof and shingle our shelter.

We almost felt like going back and doing it over again—but not for a while.

One simulated crash survival experience is usually enough to make pilots realize that no one who has not experienced a crash in the wilderness—or a realistic simulation—has any clear understanding of how he will react to it. The abrupt environmental change on impact produces a traumatic effect on most persons, even when they are not seriously injured, and often results in irrational behavior. According to Dr. Robert Keller, Associate Director of the Trauma Center at Carmel (CA) Community Hospital:

"The pilot in his enclosed cockpit, thousands of feet above the earth, is abstracted from the reality of the ground below, almost as though he were watching a film or T.V. program. He sees it, but he is not part of it. If he is IFR he may have no visible contact, only an intellectual understanding from charts, instruments and other data. Now if he crashes unexpectedly in the wilderness and survives, he may require a period of adjustment before he can accept the reality of his present ground environment. He may reject it emotionally, as one rejects bad news. Injured survivors who are bleeding or choking and require immediate aid could die while the pilot who is not prepared for this experience is adjusting to reality."

Dr. Keller, who owns his own aircraft and has been flying for 15 years, explains that the pilot who is flying over hostile terrain, especially in IFR conditions, is keyed up physiologically by the demands of his task.

"His adrenaline is elevated, his blood sugar is up, other chemical changes take place which enable him to concentrate single-mindedly on his flying tasks. Even though most of his activity is mental, he is in the classic "fight or flight" condition. If a crash occurs, his supercharged status is maintained for a time, enabling him to take appropriate life-saving actions. However, if he is not prepared to accept his new reality promptly, an opposite reaction sets in. His adrenaline is dissipated, he becomes hypoglycemic, he feels weak and helpless, perhaps panicky. Proper training can help crash survivors adjust to their new environment with a minimum loss of time and energy."

"Grounding" is one of the techniques for environmental adaptation taught in survival schools. Trainees are asked to sit together on the ground or in a circle and become physically aware of themselves and their environment. They are encouraged to look upon it not as alien or hostile ground but simply as a part of the earth-home which sustains us all in one form or another. They are asked to see the earth as the source of all human needs, an infinite challenge to human ingenuity. Garn Christensen, director of the survival school at Loman, Idaho, says:

"You want to let go of everything in the past. No regrets about the flight, no guilt over the crash, no concern over commitments you can't keep, no apologies. You assess the situation, see what you have to do to survive, and do it." The training, he feels, gives you not only the knowledge of what to do, but confidence that you will succeed. The untrained pilot who suddenly finds himself thrust into the role of medical practitioner, woodsman, mountainer, naturalist, psychologist and spiritual comforter, may feel so overwhelmed that he does nothing but despair.

Pilot responsibility for the survival of his passengers begins at the outset of the flight, with a preflight check of survival gear and a passenger briefing—preferably a typed sheet taped to a seatback, with instructions on aircraft evacuation, survival gear, use of the ELT and other signalling devices, and basic survival procedures.

Such instructions are necessary because passengers frequently are the only survivors of mountain crashes, and they need guidance. Unprepared survivors have wandered off, leaving the injured to die; have shivered in bitter cold while fuel lay in the tanks; have even resorted to cannibalism when plant food was nearby.

Bad trips like that can be avoided. ■

(Editor's note: Crash survival courses for airmen are given in most of the Rocky Mountain and western states: check with your FAA Flight Standards District Office for the name of a reputable organization.)

Minimal Survival Gear

(What you should wear or have at hand before flying over mountains: it could save your life if everything else goes up in smoke)

1. Waterproof match container
2. Strong knife
3. Full water canteen
4. Waterproof boots
5. Waterproof poncho
6. Warm jacket
7. Hat or cap
8. Gloves
9. Signalling mirror
10. Survival manual
11. Plastic tube tent or tarp
12. Large garbage bags
13. "Space blankets"
14. Nylon parachute cord
15. Flashlight, extra batteries
16. Dehydrated trail food

Cover and title photos by Aboud Dweck, "Quicksilver" ultralight flown by Jack Reynolds, FAA.

THE ULTRALIGHT SOLUTION

Separating aircraft from air vehicles

Item: *On April 11, 1981, the captain of a B-727 reported a "small, tan-colored object with wings" passing within 300 feet of his airliner as he prepared to land at Sky Harbor Airport in Phoenix, AZ.*

Item: *On July 17, 1982, the pilot of a single-engine aircraft on an IFR flight between Cincinnati and Charleston, WV reported a near collision with an unidentified flying object that passed within 100 feet of his airplane at 7,000 feet in IFR conditions. Evasive action was taken to maintain separation.*

In both instances the flying objects were identified not as a bird, a kite or a UFO, but as a variety of "hang glider," a type of flight vehicle whose antecedants are almost as old as civilized man. Human beings have suspended themselves from winged contraptions to glide down from walls, towers, and mountain tops for hundreds of years, without causing any particular disturbance. Then on December 17, 1903, the Wright brothers successfully launched their "Flyer" from ground level with the aid of a gasoline engine, and the aircraft was born. This new form of transportation temporarily relegated the foot-launched glider to the realm of antiquity, where it remained until the 1970s, when it was reborn as a sport.

Thanks to new ultra light materials derived from space age technology, plus the availability of lightweight chainsaw or snowmobile gas engines, the modern hang glider has evolved into a miniature airplane, some small enough to be folded up and transported on a man's back or on top of a car, others efficient enough to attain altitudes of over 16,000 feet. Given the low initial cost, when constructed from a kit, and the miserly fuel consumption, this is now where it is at—especially for the young at heart. The appeal of surfing, or sky diving, or even motorcycling, has paled before the excitement of zipping around the sky in a magical vehicle.

Until recently FAA was content to consider all hang gliders, even those with engines, as "non-aircraft" as long as they were capable of being footlaunched. But their sudden increase in popularity and their appearance in busy airspace created a situation that has had to be faced. An estimated 30,000 are now in use in this country alone, with manufacturers delivery projections for the decade of the 1980's running into the hundreds of thousands. Random activities in busy airspace by uncontrolled flight vehicles which have no radio and show up only weakly at best on radar could result in tragic accidents.

The FAA solution has been to create a new category of flying machine—the *ultra-light vehicle*. According to newly enacted Federal Aviation Regulation Part 103, an ultralight is any flying vehicle which:

1) is designed for single occupancy only

2) is intended for sport or recreational use only

3) does not have an airworthiness certificate

4) if unpowered, weighs less than 155 lbs.

5) if powered, weighs less than 254 lbs, and
- has a top speed of no more than 55 knots in level flight
- has a power-off stall speed no greater than 24 knots
- has a fuel capacity not exceeding five U.S. gallons

Flying vehicles which meet these definitions are to remain free of any federal regulations as regards design, construction, maintenance, airworthiness, registration, or pilot certification. This hands-off policy reflects the agency's willingness to have private individuals "self-regulate" in their own interests, under the leadership of industry and cooperative associations.

Under the new rule, the safety of the airspace will be maintained by limiting ultralight operations in terms of airspace access, right of way, flights over persons on the ground, hours of operation, and weather conditions.

Persons who operate a vehicle under Part 103 will be responsible for ascertaining that they are in compliance with all aspects of the rule. This will also require an understanding of FAA's airspace structure, as described in various aeronautical publications. In addition, ultralight operators as well as aircraft pilots should become familiar with practices established at uncontrolled airports for the separation of their vehicles during takeoff and landing. Because of their extreme sensitivity to turbulence, ultralights are highly vulnerable to wingtip vortices (swirling currents of air) from even the smallest aircraft.

At this time FAA does not anticipate providing guidance on flying techniques, but will offer helpful information on airspace procedural matters and on establishing flying sites. Operators are also referred to the publications of their manufacturer or to the ultralight divisions of the Aircraft Owners and Pilots Association (AOPA), and the Experimental Aircraft Association (EAA); to the Professional Ultralight Manufacturers Association (PUMA), and to the U.S. Hang-Gliding Assoc.

Questions and Answers

Q. Could I use my ultralight to do things like tow banners. or spray crops on my own land?

A. No. This is not sport or recreation.

Q. Can the same vehicle be operated either as an ultralight or a registered aircraft?

A. No. If the vehicle is certificated as an aircraft, even though it also meets the definition of an ultralight, it must be operated under Part 91. In order to be operated as an ultralight, the airworthiness certificate must be formally surrendered and the registration numbers removed.

Q. Can a two-place aircraft that also meets the weight and speed definition of an ultralight be operated by a single occupant who is not a certificated pilot?

A. No. Two-place design does not comply with the ultralight vehicle definition.

Q. How could I obtain "prior permission" to enter control zones, airport traffic areas, etc. during periods of light aircraft traffic?

A. By telephone or by letter of agreement with controlling air traffic facility. (Letter could cover repeated flights).

Q. What enforcement action may be taken if an ultralight is found not to be in compliance with Part 103?

A. Civil penalties up to $1,000 can be levied by FAA for each violation and each flight through legal enforcement action.

Q. To whom does an ultralight operator report an accident?

A. Such reports are voluntary only, and may be sent to the AOPA Air Safety Foundation or EAA, using a brief self-mailer form available free from these organizations.

Q. Does Part 103 apply to single place balloons?

A. Yes, for the present. Since hot air or gas balloons are "unpowered," the 155 lb. limitation would apply along with the other limitation of the rule.

Q. I understand the weight limitation excludes the weight of floats. How much of the mounting hardward are to be excluded from the empty weight?

A. Only that hardware that is a permanent, unremovable part of the floats. All other parts are considered part of the airframe and are included in the empty weight. In the case of a hull-type, the hull itself is considered an airframe rather than a float. The wingtip floats, if any, would be the only weight that could be excluded.

Excerpts from Operating Rules for Ultralights

§ 103.9 Hazardous operations

(a) No person may operate any ultralight vehicle in a manner that creates a hazard to other persons or property.

(b) No person may allow an object to be dropped from an ultralight vehicle if such action creates a hazard to other persons or property.

§ 103.11 Daylight operations.

(a) No person may operate an ultralight vehicle except between the hours of sunrise and sunset.

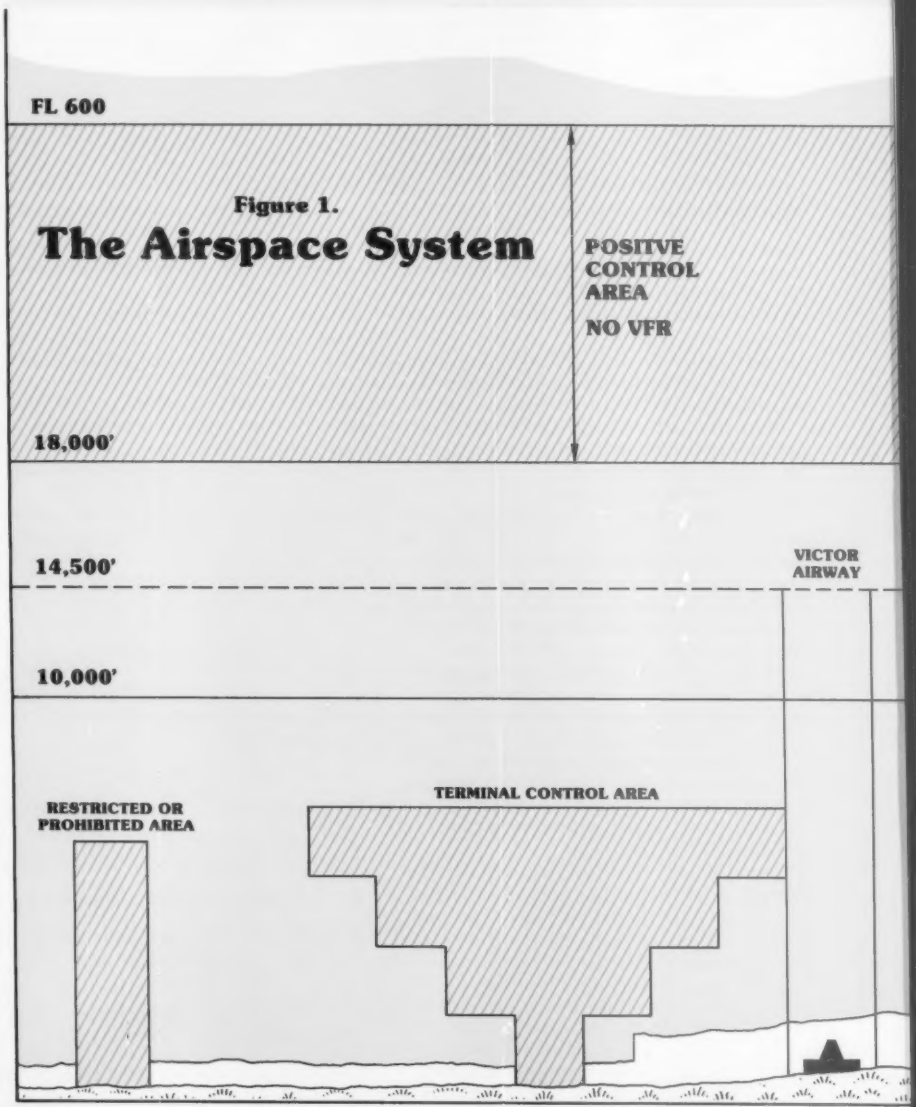
(b) Notwithstanding paragraph (a) of this section, ultralight vehicles may be operated during the twilight periods 30 minutes before official sunrise and 30 minutes after official sunset or, in Alaska, during the period of civil twilight as defined in the Air Almanac, if:

(1) The vehicle is equipped with an operating anticollision light visible for at least 3 statute miles; and

(2) All operations are conducted in uncontrolled airspace.

Figure 1.

The Airspace System



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§ 103.13 Operation near aircraft; Right-of-way rules.

(a) Each person operating an ultralight vehicle shall maintain vigilance so as to see and avoid aircraft and shall yield the right-of-way to all aircraft.

(b) No person may operate an ultralight vehicle in a manner that creates a collision hazard with respect to any aircraft.

(c) Powered ultralights shall yield the right-of-way to unpowered ultralights.

§ 103.15 Operations over congested areas.

No person may operate an ultralight vehicle over any congested area of a city, town, or settlement, or over any open air assembly of persons.

§ 103.17 Operations in certain airspace.

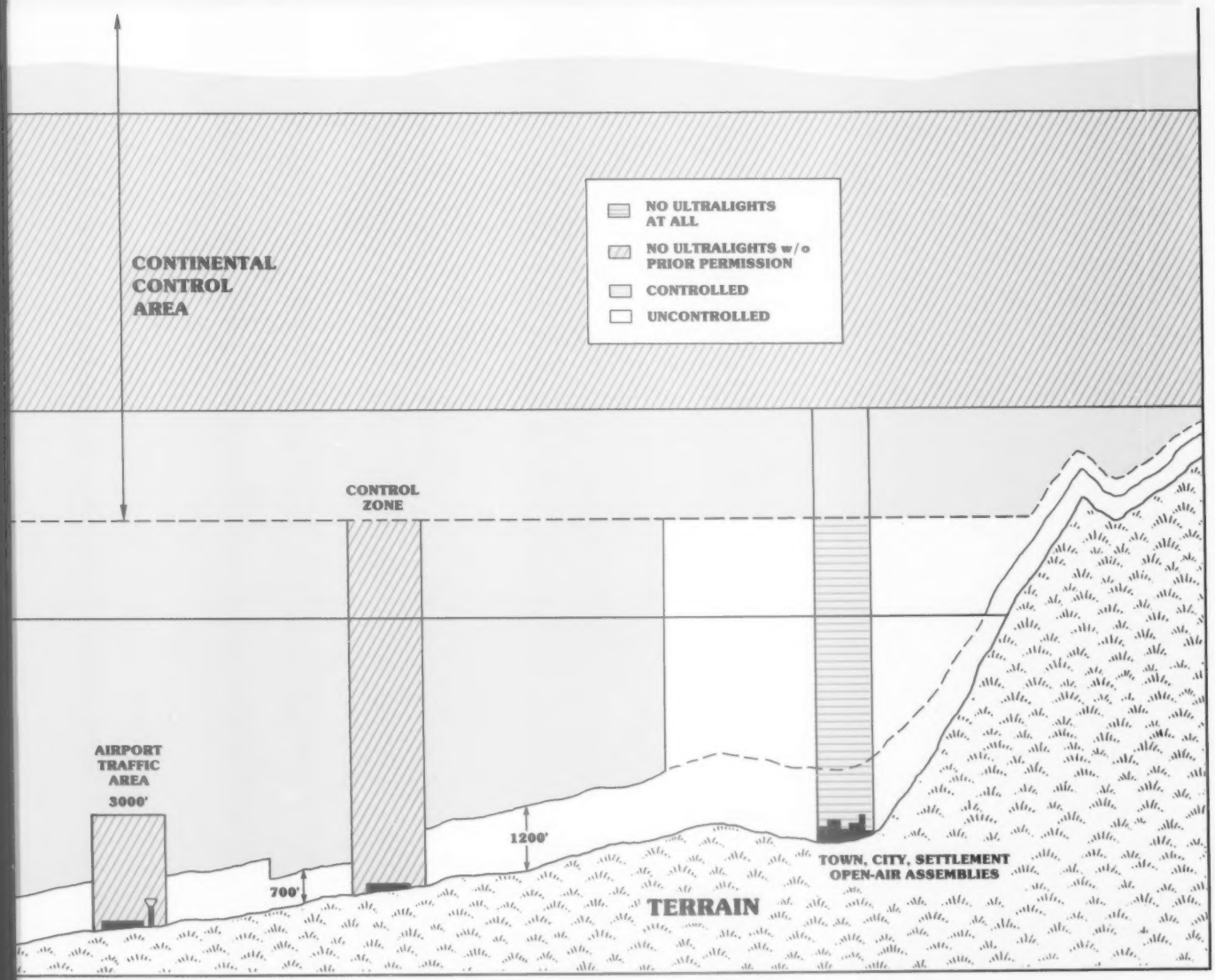
No person may operate an ultralight vehicle within an airport traffic area, control zone, terminal control area, or positive control area unless that person has prior authorization from the air traffic control facility having jurisdiction over that airspace.

§ 103.19 Operations in prohibited or restricted areas.

No person may operate an ultralight vehicle in prohibited or restricted areas unless that person has permission from the using or controlling agency, as appropriate.

§ 103.21 Visual reference with the surface.

No person may operate an ultralight vehicle except by visual reference with the surface.



Useful Sources of Information

1. *Airman's Information Manual.* Basic flight information, air traffic procedures.
2. *Pilot's Handbook of Aeronautical Knowledge.* General information on aircraft systems, instrumentation, aerodynamics, weather. Obtain price and order information for these two items from:
   Superintendent of Documents
   Government Printing Office
   Washington, DC 20402
   (202) 783-3238
3. *Sectional and VFR Terminal Area Charts.* Visual navigation aids, terrain depiction, radio aids, airports, obstructions, controlled airspace, restricted areas. TCA charts show detail of terminal control areas.
   Sectionals—$2.75 each
   TCA Charts—$2.75 each
   Order items (3) and (4) from:
   National Ocean Survey
   Distribution Division C-44
   Riverdale, MD 20737
   (202) 436-6990
4. *Ultralight Rule*/(Far Part 103)
   DOT/FAA, AFO-820
   800 Independence Ave., SW
   Washington, DC 20591
   (202) 426-8194
5. *Trade Organizations:*

   EAA
   P.O. Box 229, Hales Corner, WI 53130 (414) 425-4860

   AOPA, Air Safety Foundation
   7315 Wisconsin Avenue, Washington, DC 20014 (301) 951-3973

   PUMA
   1080 Linda Vista, San Marcus, CA 92069 (714) 744-1514

   U.S. Hang Gliding Assoc.
   P.O. Box 66306
   Los Angeles, CA 90066

VFR conditions must be maintained at all times by ultralight vehicles in flight. This requires minimum distances from clouds, in different kinds of airspace, as well as minimum visibility and constant reference to the surface.

Figure 2.

Visibility and Cloud Clearance Minimums

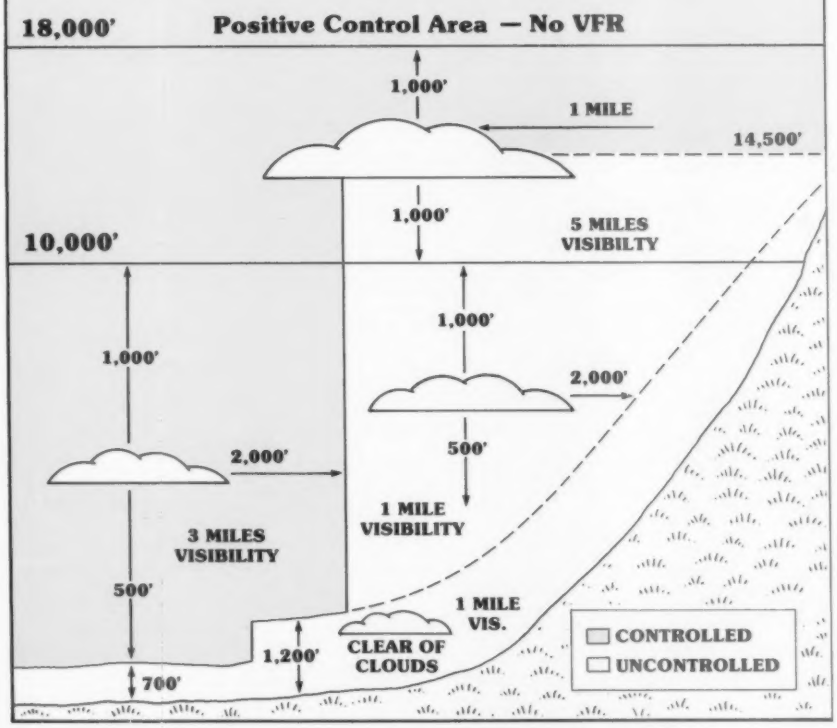
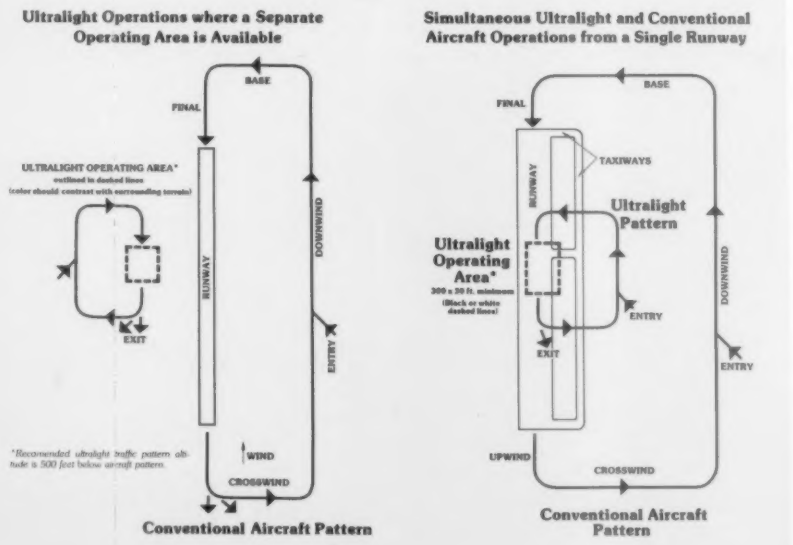


Figure 3.



Gassing up with Unleaded Regular

Breakthrough in autogas ban for low compression engines

Never is a long time.

Ever since anyone under 40 can remember we have been told NEVER to use automotive gasoline in an aircraft engine. But lo and behold, on August 6, 1982, some 50,000 persons at Oshkosh, WI saw the FAA Administrator climb into a small plane fueled with auto gas and fly away. This flight signalled the beginning of a new era in U.S. aviation, when fuel not specifically manufactured for an aircraft engine could be approved. *How did this breakthrough come about?*

Auto gas, which is refined somewhat differently from avgas, has been suspected since post WW II as a potential cause of engine failure and engine damage in aircraft. It is known to have a much higher vapor pressure, which increases the potential for vapor lock in the fuel lines at altitude and in high temperatures, as well as for fuel evaporation from the tanks. Its lesser storage stability could result in gummy engine deposits, and possibly carburetor blockage. Some of the various additives in auto gas are suspected of causing internal corrosion and valve failure in aircraft engines.

These concerns are all theoretical, but in the absence of any engineering test data to the contrary, and in the interest of flight safety, FAA maintained a ban on auto gas—except for certain experimental aircraft.

The theories were challenged in the early 1970's when fuel prices soared and a widening gap in the cost of aviation versus automobile fuel developed. In 1978 the Experimental Aircraft Association of Oshkosh, WI, with the laboratory support and approval of FAA, began a series of flight tests using 87 and higher octane unleaded auto gas in a Cessna 150. The aircraft was a standard model with the Continental O-200-A engine. The belief had been advanced by some engineers that vapor lock might not be a serious problem in a low compression normally aspirated engine of this type, in a high-wing aircraft with gravity fuel feed.

In over 700 hours of flight time with the one designated aircraft, EAA reported no significant operational problems. Even specially blended fuel with exceptionally high vapor pressure failed to result in a single case of vapor lock, in flights at 14,000 and above, during warm weather. At the end of this period the engine was disassembled and no evidence was found of corrosion, fouling, or any other unusual deterioration that could be attributed to the auto fuel used.

Consequently, FAA issued Supplemental Type Certificates for the Cessna 150 and the O-200-A Continental engine to the Experimental Aviation Association.

The STC provides for a supplement to the approved flight manual which permits the use of autogas (ASTM Specification D-439, 87 or higher anti-knock index) when certain operational limitations are observed and certain modifications are made. These include:

- replacement of the spinner with a larger approved part.
- specified placarding of each tank fuel inlet.
- ground idle speed set at no less than 700 rpm.

The amendment also advises pilots of certain operating phenomena that are possible when using autogas, such as earlier onset of carburetor icing in some conditions; and the possibility of engine stoppage when gliding or when the throttle is opened abruptly after an idling period.

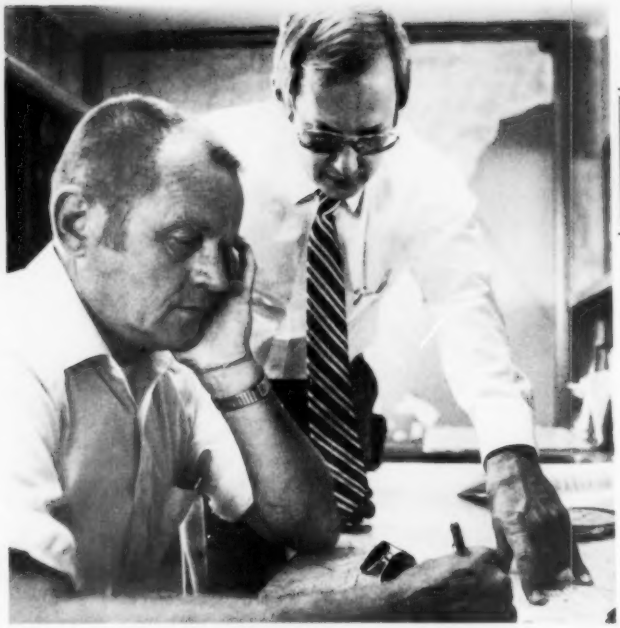
The pilot of any aircraft using autogas is responsible for operating within the provisions of the supplemental flight manual. No air taxi carriage of passengers for hire is permitted in aircraft which have been fueled with autogas, unless all tanks and sumps have been drained and the appropriate avgas supplied.

Operators of other types of aircraft are cautioned against experimenting with auto gas on their own—it is illegal and it may be unsafe. Considerable testing under controlled conditions will have to be undertaken before all the possible consequences of using auto fuel in various types of aircraft and engine designs can be learned. Note that as of this writing the *Cessna warranty does not cover any aircraft operated with other than avgas as specified by the manufacturer.*

In Great Britain auto gas has recently been approved for 120 models of light aircraft, many of them American-made and most of them highwing designs with low-compression, normally aspirated gravity-fed engines. However, auto gas for aircraft in England must be purchased from an "aerodrome installation" where it is periodically analysed (there are no such restrictions in the United States). Furthermore, flight operations are not allowed above 6,000 feet pressure altitude or when the pre-takeoff temperature exceeds 68°F (20°C).

Owners of Cessna 150s (models A through H and J through M) who wish to use auto-gas should apply for their supplemental flight manual to: EAA Aviation Foundation, Auto Fuel STC, P. O. Box 469, Hales Corners, WI, 53130. The fee is $65 ($50 for EAA members). ■

EAA chief pilot Jim Barton Testing autogassed Cessna 150.



STUDENT

Freeze-Up

Removing emotional barriers to pilot training

The student pilot, an ex-football player, had taken 10 hours of flight instruction but had not yet soloed. During the approach to land at Grove City (PA) Airport he expressed the thought that he might be a little too low. The instructor in the righthand seat reassured him and told him to continue. He initiated his flare somewhat prematurely, with the result that the aircraft landed hard on the main gear and bounced four or five feet up into the air. The student immediately opened the throttle and applied back pressure. At this point the instructor pilot said "I've got it!" and took over the controls, intending to go around. However he was unable to lower the nose, because the student had both hands tightly wrapped around the yoke and was pulling it back toward his chest. The instructor yelled at him to let go, but the student remained frozen to the yoke, and the aircraft, now under full power, entered into a nose-high attitude. The aircraft stalled and impacted the ground approximately 80 feet to the right of the runway, just short of the treeline. One wingtip struck a tree trunk and was severely damaged. There was also damage to the landing gear and propeller. The two occupants received minor injuries.

In the subsequent investigation the student disclosed that he had long suffered from an inordinate fear of flying in any kind of aircraft, and in fact had taken flying lessons in the hope it would help him overcome this fear. He had concealed his feelings from the flying school because he was afraid they might reject him as a student, or possibly expose him to the kind of ridicule he had experienced from his former teammates during team travel.

The secondary fear might have cost him his life, and in any event led to an expensive accident, which might easily have been prevented if he had made a frank disclosure of his state of mind. In that case his training schedule, in all probability, would have been modified from the standard lesson series to allow him more time in the cockpit with the instructor before imposing on him the more demanding duties of piloting.

"Student freeze-up" is not an uncommon experience for instructor pilots. Some have resorted to violence in order to prevent loss of control under critical conditions of flight. Some have died in such accidents, and others have fled to safer occupations. The student does not have to be a muscular athlete in order to block instructor takeover. When faced with an extreme, immediate threat (real or imagined), any individual is capable of exhibiting superhuman strength. When the subject is unpracticed resolving such threats or uncertain as to the appropriate action, he is likely to fix upon any random type of action available and pour all of his energy into it. This is *panic*, and it is very dangerous in an aircraft.

When you review the accidents in instructional flying reported by the National Transportation Safety Board (about 500 per year), you might come to the conclusion, at first glance, that the quality of instruction leaves something to be desired. The probable causes listed for accidents in instructional flying range over the broad spectrum known as pilot error—essentially improper technique, or poor judgment.

However, when you look closely into the details surrounding the accidents you discover that in many cases there is an emotional or personality factor involved, which often lies outside of the instructor's control—i.e., it involves, feelings or events known only to the student. The freeze-up type of accident cited above is only one of the more obvious examples of student resistance to instruction.

Flight instruction, even where simulators are much used, is always a human relationship between two persons, a student, or trainee, and an instructor. The ability of the student to absorb and learn depends not only on the quality of the instruction but also—and to a surprisingly large extent—the way the student *feels* about a specific instructor.

In earlier times students tended to regard instructor pilots with awe and even hero worship, as they were often veterans of heroic eras when flight survival depended upon extraordinary courage, strength and ingenuity. That breed of instructor has all but disappeared now and has generally been replaced by fairly young men and women wearing tight-fitting jeans and running shoes. The students themselves are no longer predominantly fresh-cheeked farm lads, but are often financially successful adults in their middle or declining years. Some of these mature adults find it uncomfortable to accept instruction from youthful pilots, but are reluctant to say so. Their unspoken resistance often extends the instruction period excessively or leads to deceptive behavior in order to receive a certificate, despite some known deficiencies in required skills.

For example, a nineteen-year old instructor, who had his own flight school in Van Nuys, CA prided himself on the rapid advancement of his students. However, he found himself up against a stone wall with one particular trainee who was obviously intelligent, dexterous (he was a well-known surgeon) and eager to learn. At one point in the course the doctor appeared simply unable to learn power-off stalls. At first the instructor assumed that the doctor might be preoccupied with a problem in the hospital, or fatigued; or perhaps that this particular aircraft was responding poorly. But finally one day, after a frustrating hour aloft, he sat down with his student over coffee and managed to ask the question: "How do you feel about taking instruction from someone less than half your age?"

"Pretty silly," was the frank answer. "I have a boy older than you. So far he's wrecked two of my cars and been thrown out of two univerisities. He works in construction, part-time. He calls when he needs money. I don't think he has anything to teach me either."

They arranged for the doctor to continue the course with an older, part-time instructor. He responded well, was certificated in short order and became an excellent pilot.

(continued on back cover)

MOISANT AVIATION *First formal flight school*

The year is 1911. You are a liberated young upper class feminist and you want desperately to break into aviation, but where can you learn? The major plane builders like the Wrights and Glen Curtiss are unsympathetic. Curtiss, disapproving of the antics of his brilliant student Blanche Scott, has declaimed that he will never again teach a woman to fly. The anti-feminist Katherine Wright has convinced her brothers that piloting is unladylike, and requires workshop maintenance and manipulating skills known only to men. Of course, there is always France, the mercy of aviation, and women are respected there. But it is so far away, and difficult when you do not speak the language. What can you do?

You are about to give it up when you hear about the new Moisant Aviation School being founded on the broad Hempstead Plains in central Long Island, New York. Their brochure not only encourages women students but assures them that after graduation they will be experts in every phase of aircraft construction and maintenance, so that in flight they will become "as companions to the birds."

Prospective enrolees are informed that the training will take at least five weeks and will follow a progressive schedule that must be mastered every step of the way, to wit:

Week 1. Daily lectures on the theory of flight and the basics of airplane construction.

Week 2. Application of theories learned the previous week. Students will be required to familiarize themselves with the purpose and mechanical function of every part of the plane before they will be allowed to fly. Women as well as men must learn to tear down and rebuild various parts of the airframe and engine.

Week 3. Training in an early version of a flight simulator. (A clipped wing, overweight monoplane, dubbed "St. Genevieve", provides a realistic environment.) This machine is at first belted to the hanger floor so that the engine could run and the prop turn, giving students a foretaste of inflight conditions. Advanced students are later allowed to taxi the unbound "St. Geneviere" around a field, protected against premature lift-offs by the unwieldly load.

Week 4. Real flying begins. The student is provided with a strong but again heavy monoplane designed to rise no more than eight feet above the ground. In this "Grasshopper" he (or she, of course) learns the rudiments of flight control.

Week 5. In a 30 hp Moisant (nee Bleriot) monoplane, called the "Goat," the student learns to make turns and to glide with the engine off. Maximum altitudes are restricted by a special elevator adjustment, in the interest of the trainee's safety.

Finally the student is allowed to solo in a standard 50 hp Moisant/Bleriot capable of speeds up to 65 mph and altitudes of about 3,000 feet. Upon graduation one is permitted to purchase the very aircraft he (or she) solos in, at a cost of $6,500.

In an age when pilots learned to fly virtually overnight this was a unique course. The fee was $750.00, a small fortune in those days (plus the $250.00 deposit for "breakage.") But for many a daring debutante the money was no problem, and in any event there was a good chance of recouping it with a few weeks of successful barnstorming.

The Moisant niche in aviation annals is a curious one. Alfred Moisant, founder of the school, was the eldest son of a French Canadian family which had emigrated to Chicago at the turn of the century. Showing an early flair for finance, Alfred had established a sugar plantation empire in San Salvador together with his brother John and both became very wealthy. When political turmoil forced them out of San Salvador in 1910, Alfred went into banking in New York but John went to France where he took up flying.

After some early difficulties in learning to fly, which convinced him that this subject was much misunderstood and neglected, John became an excellent pilot and formed his own "Moisant International Aviators," an aerobatic team which toured Europe, the United States and Mexico with great popular acclaim. John was planning to open a new kind of flight school when he was killed in a plane crash in December of 1910 near New Orleans (Moisant Field is named after him).

His brother Alfred decided to found the school in John's name, using his ideas and staffing it with the famous members of his aerobatic team. Most of these were Frenchmen, like the celebrated Roland Garros, who was later to become a leading French ace in World War I.

The Moisant school flourished during the years 1911 through 1913, which saw a parade of future aviation greats pass through its hangar doors, including the ill-fated Harriet Quimby, the first American woman to be liclensed as a pilot (and the first to die in an air crash). Other notable woman graduates included the Moisants' "kid sister," Matilde, a very successful stunt pilot who was fond of telling newspaper reporters that women were physiologically better designed then men for flying because of their more birdlike structure.

The outbreak of the war in 1914 recalled most of the Moisant instructors back to Europe, and the eventual emphasis on military flight training brought financial difficulties to civilian schools. At the war's end in 1918 the United States was flooded with ex-military pilots and instructors who set up shops in cornfields and pastures everywhere, using the war-surplus, inexpensive Curtiss *Jennys*. Alfred Moisant saw the handwriting on the wall and closed his school on Long Island.

But John Moisant's ideas for making flight training a well-rounded experience and the pilot much more than an adroit manipulator of controls did not die. In later years when civilian flying boomed again, the Moisant precepts were revived in the curricula of numerous flight training centers which helped to give this country the leadership in aviation that the Moisants envisualized in 1910, when the United States was a straggler in the race for pre-eminence in the sky. ■

FUEL RIGHT. FAA Administrator J. Lynn Helms, took part in the nationwide program to prevent misfueling by placing a color coded fuel identifier near **Citation's** fueling ports. The decals were designed by the General Aviation Manufacturers Association with support from the fuel companies and FAA. Decals can be purchased for 75¢ each from GAMA FUEL DECALS, 1025 Connecticut Ave., N.W., Washington, D.C., 20036. Specify type of decal: "Jet Fuel Only;" "Avgas Only 100, 100LL;" or "Avgas Only 80, 100, 100LL." Check or money order only.

COMMENTS ON AGE 60 RULE

In an advance notice of proposed rule making published July 15 in the *Federal Register*, FAA is asking for comments from interested parties on the "age 60" retirement rule for airline pilots. From the comments FAA will try to design a program for collecting medical and performance data on older pilots that *might* result in a rule change. (Non-airline pilots are not affected by the current rule and would not be affected by any change.)

Copies of the advance NPRM may be obtained from FAA Office of Public Affairs, APA-400, 800 Independence Ave., S.W., Washington, DC, 20591. Comments should be sent no later than November 5, 1982 to Office of the Chief Counsel, AGC-204, Docket No. 23174, same street address.

SECOND PILOT RULE EASED

Under a July 15, 1982 amendment to Part 91, operators of large airplanes (greater than 12,500 pounds) originally certificated for single-pilot operation will no longer need a second-in-command when operating under Part 91, Subpart D-Large and Turbine-Powered Multiengine Airplanes. This allows Part 91 operators of these aircraft to conduct maintenance flight testing, ferrying, executive flights, and demonstration flights without the financial burden of a second pilot.

Part 135 operators of large aircraft having 10 or more passenger seats must continue to use two pilots.

BLOCK ENGINE. A square cylinder engine that uses compressed air as "fuel" and which could be adapted to aircraft is being developed by a Colorado firm. In the photo above, conventional pistons (left) are replaced by a series of rectangular pistons within other pistons that reciprocate within a larger engine box (right). Engineers hope this radical design will cut engine weight 70% and increase efficiency 18%. A production model is being tested in a Colorado mining operation.

LATEST AIRMAN PUBLICATIONS

(These publications may be ordered without charge from DOT Publications Branch, M-443.1, Washington, DC, 20590.)

Signalling Devices

Advisory Circular 91.58, "Use of Pyrotechnic Visual Distress Signalling Devices in Aviation," provides guidelines on the acquisition, use, and safe storage of emergency signal flares which are required in some aircraft operations.

Identifying Defects

How manufacturers of aeronautical products can notify FAA of failures, malfunctions, or defects in their products that have been traced to design fault or poor quality control is discussed in updated AC 21-9A, "Manufacturers Reporting Failures, Malfunctions, or Defects."

Closing Flight Plans

AC 91.83-1B, "Cancelling or Closing Flight Plans," has been updated and re-issued to review proper VFR and IFR flight plan closing procedures.

Pilot Schools

For airman interested in adding a rating or upgrading a certificate, the latest edition of AC 140-2Q, "List of Certificated Pilot Schools," is available. Schools are listed by state, and the type of training offered is indicated.

Maintenance Advisories

Three updated maintenance publications are also available: AC 147-2W, "Directory of FAA Certificated Aviation Maintenance Technician Schools;" AC 140-7C, "FAA Certificated Maintenance Agencies Directory;" and AC 183-32C, "FAA Designated Maintenance Technician Examiners Directory."

Fire Extinguishers

Guidance in using, storing, and mounting hand fire extinguishers, as required by some FARs, is contained in AC 20-42B, "Hand Fire Extinguishers for Use in Aircraft."

AIR TAXI OPERATIONS

One-pilot air taxi operations have been relieved of the Part 135 requirements concerning training manuals, management personnel, pilot and flightcrew training, and recurrent training. Air taxi operators employing more than one pilot will have to comply with all Part 135 requirements, initiated in 1978 to bring air taxi/commuter operations more in line with air carrier safety levels.

For further information, contact Mr. Dave W. Kress, AFO-250, Commuter and Air Taxi Branch, FAA, 800 Independence Ave., S.W., Washington, DC, 20591. Telephone: (202) 426-8086.

• A Jet Not Complex?

Advisory Circular 61-58A, "Flight Instructor Practical Test Guide," states that a complex airplane (retractable gear, controllable prop, and retractable flaps) must be provided for the flight instructor flight test. Therefore, am I correct in assuming that a jet is not acceptable for the CFI check ride as it does not have a controllable prop?

Larry Williams
Murfreesboro, TN

Affirmative. Furthermore, a jet may not be able to accomplish all of the required maneuvers the CFI applicant must demonstrate, e.g., flight at critically slow airspeeds, full stalls, and spins.

• Boats vs Planes

We appreciated the article about water flying in the July-August 1982 issue of **FAA General Aviation News.** *Thank you for the credit for help received from the Seaplane Pilots Association.*

We thought you might like to know about some of the most recent statistics. For 1976 through 1980 there were only seven seaplane-boat accidents for the whole five-year period. Since the article mentions two such accidents, I thought I should point out how rare such incidents are. In fact, there were an average of only 28 total water-flying accidents a year for the study period.

Seaplane Pilots Association

• Low-Wing Aeronca

After clearing up the confusion about the Model K Aeronca that was incorrectly identified as a low-wing aircraft, I thought you might be interested in a few words about the Model "L" which **was** *the low-wing* **Aeronca.** *The Model "L" was a two-place airplane built in the late 1930's and powered by either a LeBlond or Warner radial engine. For its time it was considered a "hot" airplane and sold for about $4,000. One shows up every now and then at antique airplane shows.*

I thoroughly enjoy "General Aviation News." It serves a definite need, and usually there's always something for everyone including us old hands that were around and remember "way back when." We ain't all dead yet, so watch out!

John L. Howard
Anthony, KS

Thanks for the Model L description. Now, do any of those "old hands" (or young hands) have a Model L picture we could print?

• GAR Flights at FL 290

In the July/August 1982 issue "News" you have an article concerning the GAR system. In this short update of a somewhat complex and confusing program, you state that general aviation flights above FL 290 "on trips of 200 NM or more" require a reservation. This is not quite correct. The latest FAA Order dated July 16, 1982 on the subject exempts such flights from the GAR program and only requires a reservation at FL 290 and above for flights of less than 200 NM.

Eugene Devlin
Omaha, NB FSS

You are correct; however, the July 16 order came out after we went to press.

• Liferaft Makers

Thank you immeasurably for your most recent article entitled, "Survival at Sea." Anyone travelling over water should certainly be aware of such dangers. Could you give me the names of manufacturers who make and sell liferafts that can be inflated automatically by means of an associated or accompanying CO_2 bottle?

R. J. Giove
Burbank, CA

There are far too many such manufacturers for us to list here. Please consult the *World Aviation Directory*, available in most public libraries. See the Buyers Guide Product Cross Index section.

• Miles versus Hours

With reference to your "Famous Flights" of May/June 1982, you referred to Max Conrad having logged nearly 50,000 miles by 1964. Didn't you mean to say 50,000 **hours?**

T. V. Keating
Wheaton, IL

We certainly did. Thank You.

• Laundering the Goods

Your article "Laundering Pesticides" (July/August 1982) was very enlightening. I'd like to make some additional comments on the subject of pesticide contamination.

We have found that the majority of the more serious contaminations of clothing are related to mixing/transfer spillage of liquid preparations. The contamination may be either as a direct result of the spill or, more insidiously, as a result of walking through the spillage areas. Not only is the footwear contaminated but quite frequently the toxin is transferred to the aircraft seat bottom as the pilot enters the cockpit. The contaminated seat then contaminates the pilot's outer garment or even soaks through to the skin.

Yet another source of contamination is the handling of spray booms or nozzles, particularly when attempting to unclog them. The pesticide on these structures is usually highly concentrated because of the evaporation of diluting substances.

Although not directly connected with contaminated clothing, another potential route for an unwitting transport of these dangerous materials to the home environment occurs when personal vehicles are driven through spill areas. Parked at home, they can contaminate unsuspecting children at play around tires or in the backs of pick-up trucks—young children especially should be watched because they might actually eat or handle contaminated mud from tires.

I hope these comments have been of interest to your readers.

C. R. Crane, MD
Oklahoma City, OK

(Dr. Crane is on staff at the FAA Civil Aeromedical Institute in the toxicology department of the Aeromedical Research Branch.)

• Induction Icing Again

Thank you for printing my recent letter in your May/June 1982 "Forum," However, I'm not sure I got a complete answer. In the article on induction icing, the author states that when the temperature is over 37°F, there is no need to worry about induction icing, especially in fuel-induction systems where only air passes the throttle. My question still is, what about **below** *37°F?*

Bill Roberts
Pacific Palisades, CA

There is no fuel passing the throttle in a fuel-injected engine, and thus no opportunity for evaporative cooling. In all engines, extremely cold air will have negligible moisture in it, reducing the possibility of icing. We emphasize that you consult your pilot operating handbook or the engine manufacturer.

FAA GENERAL AVIATION NEWS welcomes comments from our readers. No anonymous letters will be used, but names will be withheld on request. Address: FAA GENERAL AVIATION NEWS, AFO-807, Washington, D.C. 20591.

• Elevation and Safe Altitude

In the May/June 1982 issue of **General Aviation News,** *the Maximum Elevation Figure on sectional charts was described as a "Minimum Safe Altitude" when it should not have been.*

Paul Best
Washington, DC

Correct. The Maximum Elevation Figure is the height of the highest obstacle or terrain in that particular quadrant of the chart plus a small safety margin. The "safe altitude" implies a more significant margin, normally 1000 ft (2000 in designated mountainous areas), that would compensate for altimeter error, pilot error, turbulence, etc.

• "Headings" not "Courses"

In the May/June issue's discussion of the Canadian Flight Rules, you used the term "headings" in relation to VFR cruising altitudes. I assume you mean "courses" as in FAR 91.109.

I really enjoy your publication.

Simon Rosenblatt
Sierra Vista, AZ

"Headings" was incorrect. The Canadians use the word "track" where we use "course."

• Conrad Again

Re: Famous Flyers, May/June 1982. Max Conrad died at the home of a friend in Summit, NJ, not at his home in Prescott, AZ.

Nit picking, but true, nevertheless.

Bert Mason, Jr.
Oregon City, OR

• Stolen Radios

I'd like to inform your readers or anyone else who can help that a King ADF, model KR87, serial number 6910 was stolen from my Piper **Seneca,** *N1544X, on June 11, 1982 on a hangar at Basel Airport, Switzerland. The local police are investigating. I was hoping you could forward this information to persons who may be in contact with facilities able to check serial numbers in avionics installations. Thank you.*

Felix Voirol
Fullindorf, Switzerland

The information has been passed to the International Aviation Theft Bureau which in turn sees that the approximate facilities receive serial numbers of stolen avionics. The Bureau may be contacted through AOPA, 7315 Wisconsin Ave., NW Washington, DC 20014.

INSTRUMENT CORNER

• Instrument Weather Training

When I am taking instruction for an instrument rating, can I log it as pilot-in-command time in actual instrument conditions when I am the sole manipulator of the controls in IFR conditions?

Name Withheld

No. A pilot receiving instrument instruction in actual instrument conditions must be rated and current in the aircraft and **already** possess an instrument rating, in order to log pilot-in-command time for such conditions.

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Student Freeze-Up *(continued from page 12)*

The gamut of instructor personality traits or habits that may irritate a student is surprisingly broad. One can be put off by an instructor who smokes, or who doesn't like your smoke; who clears his throat repeatedly; who taps you on the shoulder to get your attention; who has bad breath; who chatters incessantly; who is taciturn; who looks at his watch frequently; who mispronounces your name; who eats his lunch while you are flying; who calls you "little lady" or "old boy;" who wears loud clothes; who chews gum, etc. One young woman student recently reported difficulty concentrating on her lessons with an instructor because of the gun he carried.

He was in fact a policeman who instructed part-time. He wore his service revolver in a shoulder holster, and as he habitually removed his jacket and laid it in the back of the plane when he flew, the holstered gun was very visible, only a few inches from her arm. She had always felt uneasy around guns, ever since a childhood incident when one went off and nearly struck her, and she often found herself looking at the weapon instead of at the panel or at the environment outside the aircraft. Her lessons went badly. Finally she asked the school director to give her another instructor. He agreed, but when she told him her reason he asked her to try one more flight with the policeman. On this occasion he placed his gun under his coat in back, completely out of sight. From that point on there was no problem.

Since many students exhibit a certain amount of nervousness during some phases of training, it is not easy for an instructor to know when there is a personality clash as well. In most cases it is easier for the student to bring the matter up, if not directly to the instructor then to the head of the flight school, who is usually happy to make whatever changes are necessary. The cockpit of a small trainer is too close an environment to contain suppressed irritation. ■

Watching out for the right of way
Keeps you flying day after day.